

How They Size Air Conditioning Systems in Florida

To determine actual practices used by contractors to size air conditioners, researchers sent surveys to a general list of 5,559 HVAC contractors. The overall response rate was a respectable 9%. An analysis of the survey results found that the following typifies residential sizing practices in that state.

Sizing is accomplished using Manual J by 33% of the respondents, software is used by 34% of the respondents, square footage is used by 24%, and "other" procedures are used by 8%. Generally, respondents who are not members of ACCA were much more likely to use square footage or "other" procedures. Of the respondents reporting "other" methods, 29% use a utility's short form, 26% use their own calculations, 19% use load sheets or manuals, 11% hire others, and 14% use personal experience or other methods. And some just upsize your system 1/2 ton because they feel they need to.

Of 127 contractors indicating the square feet they estimate per ton for AC sizing, the most common response (36.2%) was 500 square feet. The range was from 350 to 700 square feet per ton and the average was 502 square feet per ton.

Fifty-two percent of respondents use a room-by-room method of sizing, 41% use whole house, and 6% use other methods.

Air-flow calculations for each room are done with square footage estimation by 30%, with software by 22%, with Manual D by 20%, with CFM-per-ton by 18%, and with other methods by 10%.

Of the 79 contractors providing a CFM per square feet estimate, 42 of them (53%) use 1.0 CFM per square feet but with a great deal of variability. A value of .8 CFM per square feet was the second most common response (10%) and a value of 1.5 CFM per square feet was the next most popular response.

Construction drawings are used for obtaining take-off measurements by 62% of the respondents with 23% making their own measurements at the site, and 10% not using take-offs.

Inaccurate Sizing Methods?

When asked about contractor experiences with inaccurate sizing methods, some responses were humorous. One contractor said "listening to the builder" was the most unreliable method, while another indicated that "listening to the homeowner" was equally problematic. The survey indicated that sizing is fairly evenly split between Manual J calculations, computer software, and estimation by floor area. Not surprisingly, each camp had strong opinions of the other methods. Many using Manual J or computerized methods regarded square footage as an inaccurate means of sizing.

Some of those using square footage mentioned that not accounting for vaulted ceilings or large expanses of glass could lead to low estimates. However, the square footage camp strongly derided Manual J and computerized methods for undersizing units. The most common reported reason for the perceived failure of Manual J or computerized methods was that customers desire lower temperatures than Manual J assumes.

Nearly 40% of the respondents indicated that they have at times purposely oversized units. Almost none purposefully undersized units. Many indicated that they round up predicted sizing by half a ton to allow for future expansion or to "reduce callbacks."

Of those who explained why they oversize, over 30% indicated a customer request - often a demand for low temperatures. By far the most commonly expressed reasons for oversizing were either to "provide more cooling" or to lower temperatures. "I oversize by 50%," indicated one contractor, "so customers will not complain."

The survey also shows that some contractors use sizing estimation values half again larger than others for sizing units, and twice as large for determining room air flow. The few respondents who did emphasize the need to size units small, were completely outnumbered by the "bigger-is-better" school.